CLAIMS

What is claimed is:

1   1.   For a network comprising a plurality of network segments, a network

2 device comprising:

3   a plurality of ports coupled to segments in the network; and

4   topology management resources which manage the plurality of ports

5 according to a spanning tree algorithm, to set an active topology for the plurality of

6 ports, including

7   memory storing parameters for specifying the active topology, the parameters

8 including information for an identification of a root of the network, identification of a

9 port in the plurality of ports for a root port role to be used for a path to the root,

10 identification of one or more ports in the plurality of ports for designated port roles to

11 be used for paths between the root and respective segments coupled to the one or

12 more ports, and identification of one or more ports in the plurality of ports for

13 alternate port roles;

14   logic to compute states for ports in the plurality of ports in response to the

15 parameters, including placing the port in the root port role in a forwarding state,

16 placing the one or more ports in the designated port roles in a forwarding state, and

17 placing the one or more ports in the alternate port roles in a blocking state; and

18   logic to manage transition of the states of the ports in the plurality of ports in

19 response to a change in the active topology, including for a port changing to a

20 designated port role, issuing a message informing a recipient that the port is able to

21 change to a forwarding state, and then upon receipt of a ready signal from the

22 recipient, causing a transition to the forwarding state.

1   2.   The network device of claim 1, wherein the logic to manage transition

2 of states includes logic for a particular port changing from the alternate port role to

3 the root port role causing transition from the blocking state to the forwarding state

4 without requiring satisfaction of a condition of a transitional state.

1   3.   For a network comprising a plurality of network segments

2 interconnected by network devices according to an active topology established by a

3 spanning tree protocol which provides at network devices a protocol entity managing

4 a plurality of ports according to a blocking state, at least one intermediate state and a

5 forwarding state, an improvement comprising:

6   storing parameters for specifying the active topology, the parameters including

7 information for an identification of a root of the network, identification of a port in

8 the plurality of ports for a root port role to be used for a path to the root, identification

9 of one or more ports in the plurality of ports for designated port roles to be used for

10 paths between the root and respective segments coupled to the one or more ports, and

11 identification of one or more ports in the plurality of ports for alternate port roles; and

12   for a particular port changing to the designated port role, issuing a message on

13 the particular port informing a recipient that the particular port is able to change to a

14 forwarding state, and then upon receipt of a ready signal from the recipient, causing

15 transition from the blocking state to the forwarding state without requiring transition

16 through the intermediate state.

1   4.   The improvement of claim 3, including for a particular port changing

2 from the alternate port role to the root port role causing transition from the blocking

3 state to the forwarding state without requiring transition through the intermediate

4 state.

1   5.   The improvement of claim 4, including information to identify one of

2 the one or more ports having the alternate port role as a next root, and in response to

3 detection of a failure of the root port, causing the alternate port identified as the next

4 root to transition from the blocking state to the forwarding state.

1   6.   The improvement of claim 3, wherein the spanning tree protocol

2 comprises a protocol compliant with IEEE Standard 802.1D.